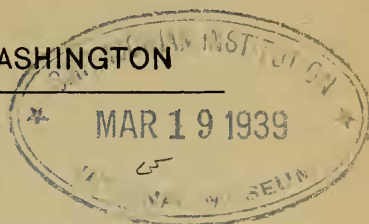


PROCEEDINGS
OF THE
BIOLOGICAL SOCIETY OF WASHINGTON



A SYNOPSIS OF PHILIPPINE LAND MOLLUSKS
OF THE SUBGENERA LAMARCKIELLA AND
PARARYSSOTA OF THE GENUS RYSSOTA.

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In 1932 I transmitted a fully illustrated manuscript on the genus *Ryssota* to the United States National Museum for publication. Shortness of funds has made it impossible to have this issued to date.

Last year I published a synopsis of the subgenus *Ryssota* in these Proceedings, and I am now giving the same treatment to the other two subgenera, namely, *Lamarckiella* and *Pararyssota*. I am practically compelled to do this, in spite of my antipathy to publish such an abbreviated treatise, by the fact that we have many calls for determination of these species, and it seems unsatisfactory to give out manuscript names or merely the statement that a new species or subspecies is represented.

To give, therefore, the names in question a status I am resorting to this method.

KEY TO THE SUBGENERA OF THE GENUS *Ryssota*.

Aperture produced at the peripheral angle.

Upper surface of last whorls not granulose.....*Ryssota*

Upper surface of last whorls granulose.....*Lamarckiella*

Aperture not produced at the peripheral angle.....*Pararyssota*

Subgenus LAMARCKIELLA.

Lamarckiella was proposed by von Möllendorff in 1898 in the *Abhandlungen der Naturforschenden Gesellschaft zu Görlitz*, volume 22, page 66, for *Ryssota*, whose nuclear whorls are axially wrinkled and the sculpture of whose postnuclear whorls is axially wrinkled and marked by axial and

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spirally incised lines, which renders the upper surface granulose, and whose periphery is sharply angulated.

He mentions *Rhysota lamarckiana* as type.

KEY TO THE SPECIES OF THE SUBGENUS *Lamarckiella*.

Shell very rough.

Periphery rounded.....*balerana*

Periphery not rounded.

Periphery angulated.....*nigrescens*

Shell not rough.

Periphery weakly angulated.

Upper surface of last whorl chestnut brown.....*hepatica*

Upper surface of last whorl not chestnut brown.

Upper surface of last whorl pale brown.....*negrosensis*

Upper surface of last whorl not pale brown.

Upper surface of last whorl horn-colored.....*bullata*

Periphery not weakly angulated.

Periphery carinated.

Upper surface of last whorl fulgurated.

Outer and basal lips strongly inpinched, strongly contracting the aperture.....*semperi*

Outer and basal lips not strongly inpinched, not strongly contracting the aperture.....*zeus*

Upper surface of last whorl not fulgurated.

Upper surface of last whorl marbled.....*deveyræi*

Upper surface of last whorl not marbled.

Upper surface of last whorl malleated.....*carinata*

Upper surface of last whorl not malleated.

Axial sculpture of last whorl very strong.....*oweniana*

Axial sculpture of last whorl not strong.....*lamarckiana*

***Ryssota (Lamarckiella) balerana*, new species.**

Shell very large, helicoid. Upper surface chestnut brown, excepting a narrow zone immediately anterior to the periphery. The base is pale horn-colored with a broad, superperipheral band which slowly fades to the rest of the basal coloration anteriorly. Aperture bluish white within, with a livid tint. Nuclear whorls 2.2; the first 1.2 marked by low, flattened, distantly spaced, retractively slanting, axial ribs; the rest by closely spaced, somewhat wavy, retractively slanting, axial riblets and numerous, spiral striations. Postnuclear whorls well rounded, marked by rather regular, retractively slanting, axial riblets, and rather regular, incised, spiral lines, the latter cutting the riblets into tubercles and giving to the surface of the whorls a granulose appearance. In addition to this there are, on the last whorl, rather feeble, oblique, scattered wrinkles. Periphery of the last whorl obsoletely angulated. Base well rounded, marked by the feeble continuations of the axial riblets, numerous spiral striations and fine oblique wrinkles which give, particularly to the posterior half of the base, a decidedly scratched-up appearance. Umbilical area slightly impressed.

Aperture large; peristome reinforced by a slight callus; outer lip decidedly protracted between the summit and periphery and somewhat inbent, and retracted from the periphery basally; the basal lip is almost straight; columella expanded and reflected as a broad callus which almost covers the umbilicus; parietal wall covered with a moderately thick callus.

The type, U. S. N. M. No. 311543, was collected by Quadras at Sitio Semento, Baler, Luzon. It has 4.8 whorls and measures: Height 35.2 mm.; greater diameter 64.4 mm.; lesser diameter 39.1 mm.

RYSSOTA (LAMARCKIELLA) NIGRESCENS Möllendorff.

Shell depressed-helicoid. The upper surface of the early whorls is chestnut brown, while that of the rest of the turns is paler. The basal portion is of a decidedly darker shade of chestnut brown. The first one and one-half nuclear turns flat, marked by strong, low, flat, broad, distantly spaced, retractively curved ribs only; the rest of the nuclear whorls are marked by closely spaced, irregular, somewhat wavy, retractively curved, sometimes anastomizing axial riblets, and numerous, strongly incised spiral lines, which render this portion of the nuclear turns finely granulous. Postnuclear whorls moderately rounded, marked by rather rough, irregularly developed, retractively curved, wrinkle-like axial riblets, and irregularly developed and irregularly spaced, incised spiral lines, the latter rendering the axial riblets interrupted, which gives to the upper surface of the whorls a somewhat granulose appearance, the long axis of the granules coinciding with the axial sculpture. In addition to this, there are irregularly developed and spaced, oblique wrinkles which increase the rough aspect of the shell. Periphery of the last whorl strongly angulated. The area immediately above and below the peripheral angle slightly inpinched. The rough sculpture described above extends upon the periphery. Base strongly rounded, slightly inflated, sometimes with an open umbilicus, while at others, in the same subspecies, this is closed by a callus. The sculpture of the base consists of poorly developed, obsolete, axial riblets and incised spiral lines of irregular strength and spacing, and numerous, oblique wrinkles, the combination lending the base a roughish appearance. Aperture large, oval; outer lip usually descending at the aperture, somewhat sinuous between the periphery and the summit, and slightly protracted in this region; from the periphery basally the outer lip is somewhat retracted; inner lip slightly curved; columella short and reflected over the umbilical area as a whitish callus; parietal wall covered with a thin callus; peritreme slightly thickened with a thin callus; interior of aperture bluish white.

This species is a high mountain form, members of which occur in the Provinces of Rizal and Bulacan. I am recognizing three subspecies.

KEY TO THE SUBSPECIES OF *Ryssota (Lamarckiella) nigrescens* Möllendorff.

- Greater diameter more than 65 mm.....*balacbacana*
- Greater diameter less than 65 mm.
- Upper surface very rough.....*nigrescens*
- Upper surface not very rough.
- Upper surface only moderately rough.....*möllendorffi*

Ryssota (Lamarckiella) nigrescens balacbacana, new subspecies.

This race comes from Mount Balacbac, Luzon. The type, U. S. N. M. No. 382955, has 4.7 whorls and measures: Height 36.2 mm.; greater diameter 66.8 mm.; lesser diameter 51.6 mm.

Ryssota (Lamarckiella) nigrescens nigrescens Möllendorff.

This subspecies comes from the region of Morong, Luzon. A topotype, U. S. N. M. No. 184623, collected by von Möllendorff, has 4.5 whorls and measures: Height 28.2 mm.; greater diameter 58.0 mm.; lesser diameter 43.5 mm.

Ryssota (Lamarckiella) nigrescens möllendorffi, new subspecies.

This race occupies the region about Montalban, Luzon. The type, U. S. N. M. No. 195667, has 4.7 whorls and measures: Height 34.8 mm.; greater diameter 63.4 mm.; lesser diameter 49.3 mm.

RYSSOTA (LAMARCKIELLA) HEPATICA Reeve.

Shell helicoid. Upper surface pale chocolate brown. There is a narrow pale band at the angulated periphery, and a broad band of dark chocolate brown immediately anterior to this which gradually fades to the greenish horn-colored tint on the rest of the base. Interior of aperture livid, slightly paler toward the edge than within. Nuclear whorls 2.1; the first flattened, the rest slightly rounded. The first 1.5 turns are marked by rather distantly spaced, low, retractively slanting, axial riblets; the rest by numerous, closely spaced, retractively slanting, axial riblets and numerous, incised, spiral lines. The postnuclear whorls are moderately well rounded and marked by rather irregular and irregularly spaced, retractively slanting, axial riblets, and numerous, more or less regularly spaced, spiral lirations, the junction of these with the axial riblets, particularly the more slender ones, forming narrowly elongated tubercles, the long axis of which coincide with the axial sculpture. Periphery of the last whorl angulated. Base slightly inflated, well rounded, marked by the feeble continuations of the axial riblets, and a few, rather distantly spaced, spiral striations on the umbilical half, and numerous, very closely spaced, microscopic spiral striations. Umbilical area moderately impressed. Aperture large, oblique; the outer lip slightly protracted between the summit and the periphery and retracted from the periphery basally; the inner lip slightly sigmoid; columella short, broadly expanded, reflected over and covering half of the umbilicus; parietal wall covered with a thin callus.

Two specimens, U. S. N. M. No. 116574, topotypes or cotypes, were collected by Mr. Hugh Cuming at Bolinao, Pangasinan, Luzon. The one described has 4.8 whorls and measures: Height 26.1 mm.; greater diameter 46.3 mm.; lesser diameter 36.4 mm.

Ryssota (Lamarckiella) negrosensis, new species.

Shell of medium size, depressed-helicoid, very thin, translucent; all but the last whorl pale chestnut brown, the latter pale brownish. In the typical

species there is a narrow, light zone immediately posterior to the periphery. The base is marked by a narrow chestnut brown zone immediately anterior to the periphery. The rest of the base is either pale brown, corresponding in tone with the upper surface of the last whorl, or tending toward horn-colored on the last half of the turn. Interior of aperture pale brown, showing the light and dark zones at the periphery. Nuclear whorls a little more than 2, well rounded; the first with a few irregular, distantly spaced, retractively slanting wrinkles; the rest with closely spaced, slender, retractively slanting, axial threads which are crossed by numerous, spiral lirations, the combination forming a granular surface. Postnuclear whorls slightly rounded, marked by rather irregularly developed and distributed and poorly differentiated, retractively slanting, axial threads, as well as numerous, very slender, closely spaced, wavy, spiral lirations. The combination of these with the finer axial sculpture produces a finely granulose appearance. Periphery of the last whorl weakly angulated. Base well rounded, but hardly inflated, marked by the continuations of the axial riblets and numerous, microscopic, spiral striations. There are also a few wrinkles near the umbilical area. Aperture large, oblique; peristome slightly reinforced at the edge; outer lip protracted between the summit and the periphery and retracted from the periphery basally; inner lip slightly curved; columella short, expanded and reflected as a brownish callus over the umbilicus, half of which it covers; parietal wall covered by a moderately thick callus.

This species is nearest related to *Ryssota (Lamarckiella) bulla*, but differs from it in being much less inflated, larger, and of entirely different color. The species is known only from the Islands of Negros and Panay at the present time.

KEY TO THE SUBSPECIES OF *Ryssota (Lamarckiella) negrosensis*.

- Narrow white zone posterior to chestnut subperipheral band present.....*negrosensis*
- Narrow white zone posterior to chestnut subperipheral band absent.....*mcgregori*

***Ryssota (Lamarckiella) negrosensis negrosensis*, new subspecies.**

This race comes from Negros Island. The type, U. S. N. M. No. 219306, has 4.0 whorls and measures: Height 20.2 mm.; greater diameter 35.7 mm.; lesser diameter 26.8 mm.

***Ryssota (Lamarckiella) negrosensis mcgregori*, new subspecies.**

This subspecies comes from the Island of Panay. The type, U. S. N. M. No. 311533, has 4.0 whorls and measures: Height 22.3 mm.; greater diameter 40.2 mm.; lesser diameter 30.6 mm.

RYSSOTA (LAMARCKIELLA) BULLA Pfeiffer.

Shell small, helicoid. The early whorls pale brown, the rest straw-colored. The base is of about the same color as the last whorl on the spire. There is a narrow, deep, chestnut brown zone immediately anterior to the

periphery. Interior of aperture flesh-colored with a purplish tinge, showing the peripheral band. Nuclear whorls 2.3 to 2.5; the first 1.3 marked by a few, rather distantly spaced, low, broad, retractively slanting ribs; the rest with numerous, closely spaced, retractively slanting, axial riblets and well developed spiral striations. Postnuclear whorls well rounded, marked by rather irregularly developed and irregularly spaced, retractively slanting riblets and numerous, slender, spiral lirations, the intersection of which with the fine axial threads form tubercles. The last whorl has, in addition to this sculpture, a few oblique wrinkles which give to it a slightly malleated impression. Periphery of the last whorl angulated. Base strongly inflated and well rounded, marked by the continuations of the axial riblets, rather distantly spaced, spiral striations and oblique scratches. Umbilicus narrow and open. Aperture large, rather flaring; peritreme reinforced at the edge; outer lip protracted between the summit and periphery and retracted from the periphery basally; inner lip slightly curved, decidedly expanded at its insertion and reflected to cover about half the umbilicus; parietal wall glazed with a thin callus.

KEY TO THE SUBSPECIES OF *Ryssota (Lamarckiella) bulla* Pfeiffer.

Inconspicuous arrow marks present.....	<i>salcedoi</i>
Inconspicuous arrow marks absent.	
Upper surface of last whorl rather roughly malleated.....	<i>steerei</i>
Upper surface of last whorl not roughly malleated.....	<i>bulla</i>

***Ryssota (Lamarckiella) bulla salcedoi*, new subspecies.**

This race comes from La Union, Luzon. The type, U. S. N. M. No. 311567, has 4.4 whorls and measures: Height 20.0 mm.; greater diameter 34.5 mm.; lesser diameter 26.8 mm.

***Ryssota (Lamarckiella) bulla steerei*, new subspecies.**

This race comes from the Island of Cebu. The type, U. S. N. M. No. 309325, has 4.0 whorls and measures: Height 22.0 mm.; greater diameter 35.1 mm.; lesser diameter 27.0 mm.

Ryssota (Lamarckiella) bulla bulla Pfeiffer.

This race comes from the Albay Province, Luzon. A cotype, U. S. N. M. No. 116579, has 4.1 whorls and measures: Height 19.7 mm.; greater diameter 33.8 mm.; lesser diameter 26.1 mm.

***Ryssota (Lamarckiella) semperi*, new species.**

Shell small, helicoid. Nuclear whorls chestnut brown. The early postnuclear whorls chestnut brown streaked with retractively curved lines of greenish yellow. These lines on the last whorl and a half become very irregular and send out lateral zigzag markings, giving to the upper surface of the shell a decidedly fulgurated appearance. On the last whorl the brown basal color and the paler areas are of equal extent. The base with a broad, subperipheral zone of brown, the anterior half being brownish horn-colored.

In addition to this, the zigzag markings described for the spire extend over the posterior half, sometimes more, of the base. The peristome is white. Interior of aperture pale brown with a purplish tinge, showing the external markings within. Nuclear whorls 2.7, well rounded, the first 1.5 marked by rather broad, low, retractively slanting, axial ribs, the rest by numerous, closely spaced, wavy, axial riblets which are crossed by numerous, slender, spiral lirations that render the surface finely granulose. Postnuclear whorls well rounded, marked by rather irregular and irregularly developed, retractively slanting, axial riblets and numerous, rather closely spaced, fine, spiral lirations, the latter forming in junction with the axial riblets fine granules, the long axis of which is parallel with the spiral sculpture. In addition to this sculpture, the last whorl has a few, oblique wrinkles which give to it a somewhat malleated appearance. Periphery of the last whorl angulated. Base depressed, well rounded, marked by the continuations of the axial riblets, rather distantly spaced, spiral striations, and numerous, rather strong, oblique wrinkles, the latter rendering the base decidedly rough, particularly on the posterior half. Umbilical area but shallowly impressed. Aperture broadly oval with the peristome slightly reinforced with a callus. The last portion of the outer lip descends below the periphery of the preceding whorl and is protracted between the summit and the periphery, and decidedly inbent. From the periphery basally it is slightly retracted and strongly rounded; inner lip evenly curved and in-pinched. This brings the inner lip and the outer lip between the summit and the periphery into almost parallel lines. Columella short, expanded and reflected over the umbilicus, which it completely covers; parietal wall closed with a thin callus.

The type, U. S. N. M. No. 311545, comes from Badajos, Tablas. It has 4.6 whorls and measures: Height 24.5 mm.; greater diameter 41.7 mm.; lesser diameter 33.2 mm.

RYSSOTA (LAMARCKIELLA) ZEUS Jonas.

Shell large, depressed-helicoid, with the early whorls chestnut brown and sometimes the entire upper surface of that coloration. As a rule, the last whorl is horn-colored. The last whorl, or whorl and a half, or even a little more, are marked with numerous, zigzag, or fulgurated bands. In some of the forms these occupy more space than the darker ground color. These fulgurations also sometimes extend over at least the posterior half of the base. The base is marked by a broad, subperipheral, dark zone followed by a lighter area which may be horn-colored or horn-colored with an olivaceous tint, or even with a brownish tint. Peristome yellowish white. Interior of aperture bluish with the dark and light external colorations showing through and giving the interior a marbled effect. Nuclear whorls well rounded, the first marked by a few, broad, low, crowded, wavy, retractively slanting, axial threads and numerous, fine, spiral lirations. Postnuclear whorls moderately rounded. In some of the forms the last whorl becomes almost flattened near the aperture between the summit and the periphery, marked by retractively slanting, irregularly developed and distributed axial riblets

and numerous, spiral lirations which are of varying strength on the last turn. These lirations in crossing the riblets form slender nodules which are not quite as well expressed, as a rule, on the last turn as they are on the preceding whorl. In addition to this, the last whorl usually has rather strong, oblique wrinkles which give it a somewhat malleated appearance. Periphery strongly carinated. Base well rounded, but not inflated, marked by the feeble continuations of the axial sculpture, numerous, spiral lirations and oblique wrinkles. The spiral lirations and the oblique wrinkles vary in strength in the different forms, but regardless of their strength they render the base, particularly on the posterior half, decidedly scratched-up in appearance. Umbilical area moderately impressed. Aperture very oblique, large; the peristome is usually thickened at the edge; the outer lip is protracted from the summit to the periphery and rather strongly inbent; basal lip retractively curved from the periphery anteriorly; inner lip evenly curved; columella expanded and reflected over the umbilicus, which it almost covers; parietal wall covered with a thin callus.

Ryssota (Lamarckiella) zeus was described by Jonas as having been collected by Cuming on the Island of Mindoro. Subsequent collectors have visited various parts of the island until we consider it fairly well explored, but none of these have found this shell on Mindoro Island. It is therefore more than likely that a transposition of labels took place and that the type lot came from Tablas. Möllendorff states, or holds the same contention, and suggests that the fact that during Cuming's days Tablas, Romblon and Sibuyan formed part of the Province of Mindoro that this locality label "Mindoro" may have been attached to the shells in question. As far as known at the present time, *Ryssota (Lamarckiella) zeus* is restricted to this group of islands and we now recognize four subspecies, one from Tablas, one from Romblon and two from the Island of Sibuyan. One of these comes from the much visited locality of San Fernando, on the southwest coast of the island, while the other one comes from Cambulayan, which is on the east shore. The island being an exceedingly mountainous one, there are undoubtedly decidedly different climatic factors in these two localities, the extremely dark race having been developed on the east side and the paler on the west.

KEY TO THE SUBSPECIES OF *Ryssota (Lamarckiella) zeus* Jonas.

Dark chestnut coloration of spire predominating over the yellow.

Spiral lirations of base coarse.....*bournsi*
Spiral lirations of base fine.....*weberi*

Dark chestnut coloration of spire not predominating over the yellow.

Spiral lirations of base coarse.....*zeus*
Spiral lirations of base fine.....*subglobosa*

***Ryssota (Lamarckiella) zeus bournsi*, new subspecies.**

This race comes from the Island of Romblon. The type, U. S. N. M. No. 311549, has 4.6 whorls and measures: Height 31.3 mm.; greater diameter 58.9 mm.; lesser diameter 43.2 mm.

Ryssota (Lamarckiella) zeus weberi, new subspecies.

This race comes from the region of Cambulayan, Sibuyan. The type, U. S. N. M. No. 311551, has 4.6 whorls and measures: Height 29.8 mm.; greater diameter 58.5 mm.; lesser diameter 43.4 mm.

Ryssota (Lamarckiella) zeus zeus Jonas.

This subspecies comes from the Island of Tablas. The specimen described, U. S. N. M. No. 311547, has 4.8 whorls and measures: Height 33.3 mm.; greater diameter 61.3 mm.; lesser diameter 44.8 mm.

Ryssota (Lamarckiella) zeus subglobosa Möllendorff.

This race comes from the Island of Sibuyan, from the region of San Fernando. A topotype, U. S. N. M. No. 311553, has 4.7 whorls and measures: Height 30.6 mm.; greater diameter 51.0 mm.; lesser diameter 39.1 mm.

Ryssota (Lamarckiella) deveyrai, new species.

Shell large, moderately elevated, rather strong. Nuclear whorls and the first postnuclear turn chestnut brown. The next half whorl is marked with somewhat numerous, lighter, zigzag lines on a chestnut brown background. On the succeeding turns these lighter lines become less irregular and more evenly retractorily slanting, though while they still show flammulations, there is nevertheless a tendency toward a development into retractorily slanting, varicial streaks. Base with a very narrow, light zone immediately anterior to the periphery, followed by a moderately broad, blackish brown band. The rest of the base is horn-colored with an olivaceous tinge, streaked at irregular intervals with varicial bands of pale brown. Nuclear whorls 2.3; the first 1.3 marked by rather low, distantly spaced, retractorily slanting, axial riblets; the rest of the nuclear whorls strongly rounded, marked by rather closely spaced, retractorily slanting, axial threads, and numerous, very closely spaced, spiral lirations, giving to the surface of this portion a finely granular appearance. Postnuclear whorls well rounded, marked by irregularly developed and irregularly spaced, retractorily slanting, axial riblets, and numerous, closely spaced, spiral lirations. These are of the same strength and spacing as those on the terminal portion of the nuclear spire. The combination of the finer axial riblets and the spiral sculpture produces a granular surface. On the last whorl there are, in addition to this, a few irregular oblique wrinkles which give it a slightly malleated appearance. Periphery carinated. Base very weakly rounded, marked by the feeble continuations of the axial sculpture and numerous, rather well incised, spiral lines which are a little more closely spaced near the umbilicus than they are toward the periphery. There is scarcely any indication of malleation here, but the axial riblets and the finer spiral sculpture produce a granular surface, which is particularly well developed on the posterior portion of the base. The umbilical area is moderately impressed. Aperture rather large, very oblique; peristome very slightly thickened at the edge; outer lip strongly protracted between the summit

and the periphery and slightly inbent, being retracted from the periphery basally; inner lip evenly curved; columella expanded and reflected over the umbilicus, which it almost covers; parietal wall glazed with a thin callus.

The type, U. S. N. M. No. 310067, comes from the Island of Burias, without specific designation of locality. It has 5.1 whorls and measures: Height 31.1 mm.; greater diameter 55.4 mm.; lesser diameter 43.4 mm.

RYSSOTA (LAMARCKIELLA) CARINATA Möllendorff.

Shell helicoid, varying in thickness from very thin to rather strong. The early whorls may be pale chestnut or chestnut in color, and the last turn may be pale brown or horn-colored. There is also a narrow, lighter zone than the general tone, a little posterior to the periphery and a brown zone, which varies in width in the various races, immediately anterior to the periphery. The rest of the base may be horn-colored or olivaceous horn-colored. All the forms have arrow marks. Sometimes the arrow marks are of brown; in some of the forms they are very conspicuous, while in others they are less apparent. The interior of aperture may be bluish white or purplish brown. The first nuclear turn is marked by low, rather broad, distantly spaced, retractively slanting, axial riblets. The rest of the nuclear whorls are marked by numerous, closely spaced, somewhat wavy, retractively slanting, axial riblets and very many closely spaced, spiral threads. The postnuclear whorls are marked by retractively slanting axial riblets which vary in strength and spacing in the different races, and numerous spiral threads. The intersection of the axial and spiral sculpture forms granules which give to the entire surface a granulose appearance, even that of the last whorl. Periphery angulated. Base varying from slightly inflated to strongly inflated in the different races, always shining, marked by the continuations of the axial sculpture, numerous fine spiral striations and many oblique wrinkles, which are usually very fine. Aperture large and oblique, with the peristome usually slightly reinforced in adult shells; the outer lip is protracted between the summit and the periphery and retracted from the periphery basally; inner lip either evenly curved or slightly sinuous; columella broadly expanded and reflected over the umbilicus, half or more of which it covers.

This species appears to occupy northwestern Luzon, ranging from Ilocos Sur through Benguet to Lepanto.

KEY TO THE SUBSPECIES OF *Ryssota (Lamarckiella) carinata*.

Upper surface horn-colored.

Shell inflated.....*benguetana*
Shell not inflated.....*carinata*

Upper surface not horn-colored.

Upper surface brown.

Greater diameter more than 35 mm.....*cervantesana*
Greater diameter less than 30 mm.....*lepantoana*

Ryssota (Lamarckiella) carinata benguetana, new subspecies.

This subspecies comes from Benguet, Luzon. The type, U. S. N. M. No. 382960, has 4.2 whorls and measures: Height 18.2 mm.; greater diameter 27.0 mm.; lesser diameter 21.9 mm.

Ryssota (Lamarckiella) carinata carinata Möllendorff.

This race comes from Mount Tila, Luzon. A topotype, U. S. N. M. No. 382962, has 4.3 whorls and measures: Height 19.7 mm.; greater diameter 35.1 mm.; lesser diameter 28.1 mm.

Ryssota (Lamarckiella) carinata cervantesana, new subspecies.

This subspecies comes from the region of Cervantes, Luzon. The type, U. S. N. M. No. 382963, has 4.5 whorls and measures: Height 20.1 mm.; greater diameter 35.8 mm.; lesser diameter 28.1 mm.

Ryssota (Lamarckiella) carinata lepantoana, new subspecies.

This subspecies comes from Balaca, Lepanto, Luzon. The type, U. S. N. M. No. 382964, has 4.5 whorls and measures: Height 17.7 mm.; greater diameter 29.8 mm.; lesser diameter 24.0 mm.

RYSSOTA (LAMARCKIELLA) OWENIANA Pfeiffer.

Shell small, depressed-helicoid, varying in color from dark chestnut brown to horn-colored on the upper surface, but no matter what the general coloration is, there is always a broad light zone immediately posterior to the periphery. Anterior to the periphery there is a broad chestnut colored band. The rest of the base, as a rule, is green, though sometimes it is horn-colored with a brownish or olivaceous tinge. Nuclear whorls 2.5, well rounded; the first is marked by rather closely spaced, retractively slanting, axial riblets; the rest by numerous, very fine, wavy, very closely spaced, retractively slanting, axial riblets and numerous, very fine, spiral lirations. Postnuclear whorls moderately well rounded and marked by retractively slanting, axial riblets and numerous, very fine, spiral lirations which give to the upper surface of the whorl a finely granulose appearance. On the last portion of the last whorl there are also a number of poorly developed malleations. Periphery strongly angulated. Base well rounded, marked by the continuations of the axial riblets, poorly impressed spiral striations, and numerous oblique wrinkles. These are very strong near the periphery but become evanescent toward the umbilical area. Aperture large, very oblique; peristome slightly reinforced at the edge; outer lip protracted between the summit and periphery and slightly retracted from the periphery basally; basal lip somewhat sinuous; columella expanded and reflected over half of the umbilicus; parietal wall glazed by a moderately thick callus.

This species appears to extend over the islands of Cebu, Negros and Panay.

The following key will help to differentiate the subspecies from these three islands.

KEY TO THE SUBSPECIES OF *Ryssota (Lamarckiella) oweniana*.

- Incremental lines of last whorl very rough on upper surface.....*smithi*
 Incremental lines of last whorl not very rough on upper surface.
 Last whorl rather strongly malleated on last one-fourth of upper
 surface.....*oweniana*
 Last whorl not rather strongly malleated on last one-fourth of
 upper surface.....*inflatula*

Ryssota (Lamarckiella) oweniana smithi Bartsch.

This subspecies comes from Passi, Iloilo, Panay. The type, U. S. N. M. No. 311021, has 4.5 whorls and measures: Height 25.3 mm.; greater diameter 43.0 mm.; lesser diameter 33.5 mm.

Ryssota (Lamarckiella) oweniana oweniana Pfeiffer.

This subspecies comes from the Island of Cebu. A topotype, U. S. N. M. No. 382967, has 4.5 whorls and measures: Height 20.9 mm.; greater diameter 40.3 mm.; lesser diameter 30.1 mm.

Ryssota (Lamarckiella) oweniana inflatula Möllendorff.

This race comes from the Island of Negros. A topotype, U. S. N. M. No. 256390, has 4.4 whorls and measures: Height 26.4 mm.; greater diameter 53.3 mm.; lesser diameter 44.1 mm.

RYSSOTA (LAMARCKIELLA) LAMARCKIANA Lea.

Shell large, helicoid. The early whorls pale chestnut brown, the rest pale brown, horn-colored, or horn-colored with an olivaceous tint on the upper surface. There is usually a narrow lighter zone immediately posterior to the periphery, and a broad chestnut brown band immediately anterior to the periphery. The rest of the base may be pale green horn-colored or horn-colored with a brownish tinge. There may also be present brownish varicial streaks of varying width. The interior of the aperture may be bluish white, or bluish white with a purplish tinge, the light super-peripheral zone and dark subperipheral zone showing within. Nuclear whorls a little more than 2; the first with a few broad, low, distantly spaced, retractively slanting, axial riblets and the rest with numerous, closely crowded, wavy, retractively slanting, axial threads. In addition to this there are numerous, closely spaced, spiral threads. Postnuclear whorls rather well rounded, marked by more or less regular, retractively slanting, closely spaced, axial threads, and numerous spiral lirations. The junction of these two elements renders the upper surface decidedly granulose, even on the last portion of the last turn. The last whorl also, on the upper surface, may have a few scattered malleations. Periphery strongly angulated. Base well rounded, marked by the feeble continuations of the axial riblets, incised spiral lines, which are of rather regular distribution, becoming a little more closely spaced toward the umbilicus, and numerous oblique fine wrinkles, which are particularly well developed toward the periphery. Aperture large, oblique;

peristome slightly reinforced at the edge; outer lip protracted between the summit and the periphery and slightly retracted between the periphery and the base; basal lip somewhat sinuous; columella broadly expanded and reflected over the umbilicus.

This species extends over the islands of Ticao, Masbate, Sibuyan, Panay, Cebu and Guimaras. The forms break up into the various subspecies, which the following key will help to differentiate.

KEY TO THE SUBSPECIES OF *Ryssota (Lamarckiella) lamarckiana* Lea.

Upper surface pale chestnut brown.

Last half of last whorl malleated on upper surface.

Granular sculpture coarse on upper surface of last whorl....*granulosa*²

Granular sculpture not coarse on upper surface of last whorl.....
lamarckiana

Last half of last whorl not malleated on upper surface.

Base horn-colored.....*ticaoensis*

Base not horn-colored.

Base olivaceous.....*granulosa*²

Upper surface not pale chestnut brown.

Upper surface of last whorl greenish.

Base of last whorl rather inflated.

Oblique wrinkles of base strong.....*guimarasensis*

Oblique wrinkles of base feeble.....*legaspii*

Base of last whorl not inflated.....*sibuyanensis*

Ryssota (Lamarckiella) lamarckiana lamarckiana Lea.

The typical subspecies comes from the Island of Masbate. Lea's type, U. S. N. M. No. 116563, has 4.7 whorls and measures: Height 30.6 mm.; greater diameter 55.5 mm.; lesser diameter 43.5 mm.

Ryssota (Lamarckiella) lamarckiana ticaoensis, new subspecies.

This race comes from the Island of Ticao. The type, U. S. N. M. No. 256228, has 4.5 whorls and measures: Height 28.5 mm.; greater diameter 46.0 mm.; lesser diameter 37.2 mm.

Ryssota (Lamarckiella) lamarckiana granulosa Möllendorff.

Von Möllendorff cites this subspecies from Antique, Panay, and gives the measurements for it as: Height 33.2 mm.; greater diameter 58.6 mm. I have not seen specimens of it.

Ryssota (Lamarckiella) lamarckiana guimarasensis, new subspecies.

This subspecies comes from the Island of Guimaras. The type, U. S. N. M. No. 311569, has 5 whorls and measures: Height 29.0 mm.; greater diameter 49.2 mm.; lesser diameter 38.6 mm.

² Not having seen *granulosa* I have placed it in two positions.

Ryssota (Lamarckiella) lamarckiana legaspii, new subspecies.

This race comes from the Island of Cebu. The type, U. S. N. M. No. 311571, has 4.8 whorls and measures: Height 26.0 mm.; greater diameter 41.1 mm.; lesser diameter 33.0 mm.

Ryssota (Lamarckiella) lamarckiana sibuyanensis, new subspecies.

This subspecies comes from the Island of Sibuyan. The type, U. S. N. M. No. 311570, has 4.6 whorls and measures: Height 30.8 mm.; greater diameter 52.0 mm.; lesser diameter 40.8 mm.

Subgenus PARARYSSOTA.

In this subgenus the shell is huge and ponderous as in the larger species of *Ryssota*, but the aperture is not protracted at the periphery, the outer lip being evenly curved.

Type.—*Ryssota (Pararyssota) maxima* Pfeiffer.

KEY TO THE SPECIES OF THE SUBGENUS *Pararyssota*.

Aperture broadly oval.....	<i>maxima</i>
Aperture not broadly oval.	
Aperture lunate.....	<i>quadras</i>

RYSSOTA (PARARYSSOTA) MAXIMA Pfeiffer.

Shell very large, helicoid. Upper surface of the whorls, including the nucleus, brown, a little lighter at the apex than on the last turn. Nuclear whorls slightly rounded, marked on the first turn by rather distantly spaced, and on the succeeding turns by rather closely spaced, obsolete, retractively curved, axial threads. Postnuclear whorls marked by rather strong, irregular, retractively slanting lines of growth, and numerous, moderately strong, spiral lirations. The lines of growth and spiral lirations to the surface of the shell a somewhat cloth-like texture. The postnuclear whorls are covered with a moderately thick periostracum, which consists of dark and light spiral zones. The light zones are hydrophanous and frequently break away in mature shells. This leaves exposed the flesh-colored shell below the periostracum and gives to the upper surface of the shell a decidedly banded appearance. Periphery more or less angulated. Base well rounded, chestnut brown, marked by strong, irregular, incremental lines and exceedingly fine, closely spaced, spiral striations. Aperture large, oval, oblique, not turned out at the periphery as in *Ryssota* proper; peristome thickened at the edge in adult shells, less so between the summit and the periphery than between the periphery and the base; inner lip strongly curved, thickened and reflected over at its insertion as a thick callus that almost covers the umbilicus; parietal wall covered by a moderately thick callus.

This species appears restricted to the Island of Mindanao.

KEY TO THE SUBSPECIES OF *Ryssota* (*Pararyssota*) *maxima* Pfeiffer.

Periphery strongly keeled.

Shell broadly conic.

Greater diameter more than 75 mm.....*maxima*

Greater diameter less than 75 mm.....*mororum*

Shell not broadly conic.

Shell conic.....*mearnsi*

Periphery not strongly keeled.

Periphery obscurely angulated.....*davaoana*

Ryssota (*Pararyssota*) *maxima maxima* Pfeiffer.

This race appears to occupy Agusan Valley, Mindanao. A specimen, U. S. N. M. No. 315623, has 7.2 whorls and measures: Height 65.2 mm.; greater diameter 95.3 mm.; lesser diameter 80.0 mm.

Ryssota (*Pararyssota*) *maxima mororum* Pilsbry.

This race comes from Misimis Province, Mindanao, opposite Camiguin Island. U. S. N. M. No. 311501, has 5.5 whorls and measures: Height 43.0 mm.; greater diameter 74.5 mm.; lesser diameter 59.4 mm.

Ryssota (*Pararyssota*) *maxima mearnsi*, new subspecies.

This race comes from the valley of the Baganga River. The type, U. S. N. M. No. 256263, has 6.9 whorls and measures: Height 58.0 mm.; greater diameter 80.5 mm.; lesser diameter 67.1 mm.

Ryssota (*Pararyssota*) *maxima davaoana*, new subspecies.

This race comes from the region of Davao. The type, U. S. N. M. No. 256398, is a broken specimen which measures: Greater diameter 77.2 mm.; lesser diameter 61.3 mm.

RYSSOTA (PARARYSSOTA) QUADRASI Hidalgo.

Shell of medium size, helicoid, rather elevated. The early whorls pale chestnut brown, the rest greenish horn-colored on the posterior half and brown on the anterior half between the summit and periphery. Base with a broad dark brown zone immediately anterior to the periphery and the rest pale brown or greenish horn-colored. In addition to this, the whorls are marked by irregular flammulations or zigzag, hydrophanous, more or less axial bands which sometimes extend below the periphery on to the base. Interior of aperture bluish white. Nuclear whorls 2.7, slightly rounded, marked by numerous, closely spaced, slightly zigzag, axial, threadlike riblets which are about half as wide as the spaces that separate them, and rather fine spiral striations. Postnuclear whorls inflated, well rounded, marked by numerous, coarse, wrinkle-like axial markings between which are fine lines of growth and numerous, closely spaced, fine, spiral lirationations. The intersection of the fine axial and spiral sculpture gives to the surface of the shell a cloth-like texture. This fine sculpture is much more strongly

developed on the first three whorls than on the last turn where it becomes less conspicuous and where the periostracum becomes crinkly. Suture strongly impressed, which gives to the spire a somewhat broadly conic, bee-hive shape. Periphery obtusely angulated. Base well rounded but not inflated, marked by the continuation of the axial wrinkles and the finer axial lines of growth between these and numerous microscopic, closely spaced, spiral striations. Aperture narrowly oval, oblique; outer lip strongly arched between the summit and the periphery and considerably less so between the periphery and the base, which is rather flattened; the peristome is not thickened from the summit to the periphery and only moderately so from the periphery to the base, the basal portion, however, is conspicuously thickened; columella forming somewhat of an angle at its junction with the basal lip slightly curved, slightly sinuous and expanded at its insertion, where it is reflected to almost cover the umbilicus; parietal wall covered by a thin callus which allows the colors of the preceding whorl to shine through.

The specimen described, U. S. N. M. No. 311496, was collected by Quadras on Catanduanes Island. It has 7.2 whorls and measures: Height 47.5 mm.; greater diameter 72.8 mm.; lesser diameter 62.3 mm.